Moving towards clean cooking in China

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Domestic use of solid fuels is a major source of household air pollution and a substantial contributor to ambient air pollution, particularly in developing global regions. Solid fuel use can increase risks for many cardiopulmonary diseases; in the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2017, household air pollution from solid fuel use was estimated to account for about 1·6 million deaths,[1] and this number could be underestimated in areas with a high prevalence of solid fuel use. Developing countries such as China are seeing rapid urbanisation, which is accompanied naturally by a general transition from use of solid fuels to clean energy. Accordingly, assessment of how risks and disease burden would change because of this transition, and use of ventilation facilities, is of public health importance.

In previous cohort studies,[2–4] solid fuel use was associated with high mortality risk. These studies also provided preliminary evidence showing reduced mortality risks after cessation of solid fuel use, but it remains unclear about the time course of the risk reduction during the years immediately after cessation. In *The Lancet Global Health*, Kuai Yu and colleagues confirm the association of solid fuel use with elevated mortality risk in 171 677 participants of the China Kadoorie Biobank study from five urban areas of China.[5] Moreover, they show the significant association between cessation of solid cooking fuel use and reduced mortality risks during the subsequent 10 years. Yu and colleagues noted a rapid decrease in mortality risks with increasing years after cessation of solid fuel use, and estimated a reduction of more than 60% in risks of all-cause and cardiopulmonary mortality in the first 5 years. These associations were confirmed by stratified analyses and sensitivity analyses, lending credence to a causal relation between suspension of solid fuel use and reduced mortality risks. Another important finding is the reduced mortality risk associated with use of ventilation in people using both solid and clean fuels. These results are highly encouraging because of the substantial health benefits that can be achieved immediately after cessation of solid fuel use, and because use of low-cost ventilation can provide health benefits even among clean fuel users, since combustion of clean fuel also generates pollutants.

Yu and colleagues point out that there might still be some residual confounding by unmeasured time trends, whereby outdoor air quality, socioeconomic status, and governmental policies on energy use are all improved during follow-up of this cohort. Moreover, transition in secondary cooking fuels, types of heating fuels, quality of solid fuels, and ventilation efficiency might also have affected the study findings; further investigation of these potential health benefits is warranted. Suspension of solid fuel use did not mean simultaneous uptake of clean fuels in China[6] and, as a result, solid-fuel cessation and clean-fuel adoption should be considered jointly in future studies. Finally, a comprehensive assessment of costs and health benefits of a series of transitions in household energy structure and ventilation facilities would be indispensable in governmental policy-making processes to optimally improve public health, particularly in areas having financial and cultural limitations.

Empirically, large, prospective, cohort studies have provided evidence for formulation of regulatory policies and standards. Yu and colleagues report data for the largest cohort to date and show the immediate and considerable reduction of mortality risks in association with the transition from use of solid fuels to clean fuels and use of ventilation in China.[5] This longitudinal investigation fills the gap in current knowledge about the time course of beneficial health effects occurring with such transitions. Evidence will become clearer and more credible when further investigations monitor personal exposures to particulate matter and its constituents, such as carbon monoxide, nitrogen oxides, and organic compounds, which are emitted by household fuel combustion.[7] Another policy motivation is that black carbon generated from solid-fuel combustion is not only an important toxic component of particulate matter but also a major short-lived climate forcer (atmospheric compound); therefore, interventions to exclude use of solid fuels or improve their combustion efficiency would earn added health benefits in terms of climate change mitigation.[8] Collectively, because about 3 billion people still use solid fuel, and many migrants from rural to urban areas face poor-quality housing problems during urbanisation, investigations of interventions to enhance the transition of household energy and promote use

of ventilation facilities would substantially address environmental concerns and improve global health.

We declare no competing interests.

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